UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/686,115	10/11/2000	Charu C. Aggarwal	YOR920000429US1	4940

7590 02/21/2007	EXAMINER
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ART UNIT	PAPER NUMBER
2129	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

PTOL-90A (Rev. 10/06)

	Application No.	Applicant(s)
Office Action Summary	09/686,115	AGGARWAL, CHARU
	Examiner	Art Unit
	Wilbert L. Starks, Jr.	2129

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>23 October 2006</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-30</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-30</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

U.S. Patent and Trademark Office

PTOL-326 (Rev. 08-06)   **Office Action Summary**   Part of Paper No./Mail Date 20070220

DETAILED ACTION

Claim Rejections - 35 U.S.C. §101

1.   35 U.S.C. §101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

the invention as disclosed in claims 1-30 is directed to non-statutory subject matter.

2.   Regardless of whether any of the claims are in the technological arts, none of them is limited to practical applications in the technological arts. Examiner finds that _In re Warmerdam_, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994) controls the 35 U.S.C. §101 issues on that point for reasons made clear by the Federal Circuit in _AT&T Corp. v. Excel Communications, Inc._, 50 USPQ2d 1447 (Fed. Cir. 1999). Specifically, the Federal Circuit held that the act of:

> ...[T]aking several abstract ideas and manipulating them together adds nothing to the basic equation. *AT&T v. Excel* at 1453 quoting *In re Warmerdam*, 33 F.3d 1354, 1360 (Fed. Cir. 1994).

Examiner finds that Applicant's "data set" references are just such abstract ideas.

3.   Examiner bases his position upon guidance provided by the Federal Circuit in _In re Warmerdam_, as interpreted by _AT&T v. Excel_. This set of precedents is within the

same line of cases as the *Alappat-State Street Bank* decisions and is in complete

agreement with those decisions. *Warmerdam* is consistent with *State Street*'s holding

that:

> Today we hold that *the transformation of data, representing* <u>*discrete dollar*</u>
> <u>*amounts*</u>*, by a machine through a series of mathematical calculations into a*
> *final share price*, constitutes a practical application of a mathematical
> algorithm, formula, or calculation because it produces 'a useful, concrete and
> tangible result" -- *a final share price momentarily fixed for recording purposes*
> *and even accepted and relied upon by regulatory authorities and in*
> *subsequent trades.* (Emphasis added) *State Street Bank* at 1601.

4.   True enough, that case later eliminated the "business method exception" in order

to show that business methods were not per se nonstatutory, but the court clearly *did*

not go so far as to make business methods *per se statutory.* A plain reading of the

excerpt above shows that the Court was *very specific* in its definition of the new

practical application. It would have been much easier for the court to say that "business

methods were per se statutory" than it was to define the practical application in the case

as "...the transformation of data, representing discrete dollar amounts, by a machine

through a series of mathematical calculations into a final share price..."

5.   The court was being very specific.

6.   Additionally, the court was also careful to specify that the "useful, concrete and

tangible result" it found was "a final share price momentarily fixed for recording

purposes and even accepted and <u>relied upon</u> by regulatory authorities and in

subsequent <u>trades</u>." (i.e. the trading activity is the <u>further practical use</u> of the real world

monetary data beyond the transformation in the computer – i.e., "post-processing

activity".)

7.   Applicant cites no such specific results to define a useful, concrete and tangible

result. Neither does Applicant specify the associated practical application with the kind

of specificity the Federal Circuit used.

8.   Furthermore, in the case *In re Warmerdam*, the Federal Circuit held that:

> ...[T]he dispositive issue for assessing compliance with Section 101 in this
> case is whether the claim is for a process that goes beyond simply
> manipulating "abstract ideas' or 'natural phenomena' ... As the Supreme
> Court has made clear, '[a]n idea of itself is not patentable, ... *taking several*
> *abstract ideas and manipulating them together adds nothing to the basic*
> *equation*. In re Warmerdam 31 USPQ2d at 1759 (emphasis added).

9.   Since the Federal Circuit held in *Warmerdam* that this is the "dispositive issue"
when it judged the usefulness, concreteness, and tangibility of the claim limitations in
that case, Examiner in the present case views this holding as the dispositive issue for
determining whether a claim is "useful, concrete, and tangible" in similar cases.
Accordingly, the Examiner finds that Applicant manipulated a set of abstract "data sets"
to solve purely algorithmic problems in the abstract (i.e., what *kind* of "data set" is used?
Algebraic word problems? Boolean logic problems? Fuzzy logic algorithms?
Probabilistic word problems? Philosophical ideas? Even vague expressions, about
which even reasonable persons could differ as to their meaning? Combinations
thereof?) Clearly, a claim for manipulation of "data sets" is provably even more abstract
(and thereby less limited in practical application) than pure "mathematical algorithms"
which the Supreme Court has held are per se nonstatutory — in fact, it *includes* the
expression of nonstatutory mathematical algorithms.

10.   Since the claims are not limited to exclude such abstractions, the broadest
reasonable interpretation of the claim limitations includes such abstractions. Therefore,
the claims are impermissibly abstract under 35 U.S.C. §101 doctrine.

11.   Since *Warmerdam* is within the *Alappat-State Street Bank* line of cases, it takes

the same view of "useful, concrete, and tangible" the Federal Circuit applied in *State*

Street Bank. Therefore, under *State Street Bank*, this could not be a "useful, concrete

and tangible result". There is only manipulation of abstract ideas.

12.   The Federal Circuit validated the use of *Warmerdam* in its more recent *AT&T*

Corp. v. Excel Communications, Inc. decision. The Court reminded us that:

> Finally, **the decision in In re Warmerdam**, 33 F.3d 1354, 31
> USPQ2d 1754 (Fed. Cir. 1994) **is not to the contrary.** *** The court found
> that the claimed process did nothing more than manipulate basic
> mathematical constructs and concluded that 'taking several abstract ideas
> and manipulating them together adds nothing to the basic equation';
> hence, the court held that the claims were properly rejected under §101
> Whether one agrees with the court's conclusion on the facts, the holding of
> the case is a straightforward application of the basic principle that mere laws
> of nature, natural phenomena, and abstract ideas are not within the
> categories of inventions or discoveries that may be patented under §101.
> (emphasis added) AT&T Corp. v. Excel Communications, Inc., 50
> USPQ2d 1447, 1453 (Fed. Cir. 1999).

13.   Remember that in *In re Warmerdam*, the Court said that this was the dispositive

issue to be considered. In the *AT&T* decision cited above, the Court reaffirms that this is

the issue for assessing the "useful, concrete, and tangible" nature of a set of claims

under §101 doctrine. Accordingly, Examiner views the *Warmerdam* holding as the

dispositive issue in this analogous case.

14.   The fact that the invention is merely the manipulation of *abstract ideas* is clear.

The data referred to by Applicant's phrase "data set" is simply an abstract construct that

does not limit the claims to the transformation of real world data (such as monetary data

or heart rhythm data) by some disclosed process. Consequently, the necessary

conclusion under *AT&T, State Street* and *Warmerdam,* is straightforward and clear.

The claims take several abstract ideas (i.e., "data sets" in the abstract) and manipulate

them together adding nothing to the basic equation. Claims 1-30 are, thereby, rejected

under 35 U.S.C. §101.

Claim Rejections - 35 U.S.C. §112

The following is a quotation of the first paragraph of 35 U.S.C. §112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

15.   Claims 1-30 are rejected under 35 U.S.C. §112, first paragraph because current

case law (and accordingly, the MPEP) require such a rejection if a §101 rejection is

given because when Applicant has not in fact disclosed the practical application for the

invention, as a matter of law there is no way Applicant could have disclosed *how* to

practice the *undisclosed* practical application. This is how the MPEP puts it:

> ("The how to use prong of section 112 **incorporates as a matter of law** the requirement of 35 U.S.C. 101 that the specification disclose as a matter of fact a practical utility for the invention.... <u>If the application fails as a matter of fact to satisfy 35 U.S.C. § 101, then the application **also fails as a matter of law to enable one of ordinary skill in the art to use the invention under 35 U.S.C. § 112.**"</u>); In re Kirk, 376 F.2d 936, 942, 153 USPQ 48, 53 (CCPA 1967) ("Necessarily, compliance with § 112 requires a description of how to use presently useful inventions, **otherwise an applicant would anomalously be required to teach how to use a useless invention.**") See, MPEP 2107.01(IV), quoting In re Kirk (emphasis added).

Therefore, claims 1-30 are rejected on this basis.

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2.   Claims 1, 10, 11, 20, 21, and 30 are rejected under 35 U.S.C. 102(a) as being

anticipated by Yoshioka, et al., Signal separation method using ICA Systems, Man, and

Cybernetics, 1999. IEEE SMC '99 Conference Proceedings. 1999 IEEE International

Conference on, Volume 1, 12-15 Oct. 1999 Page(s): 549 - 552 vol.1. Specifically:

Claim 1

Claim 1's "determining one or more subsets of dimensions and corresponding

ranges in the data set which are sparse in density using an algorithm capable of utilizing

at least one of the processes of solution recombination, selection and mutation over a

population of multiple solutions; and" is anticipated by Yoshioka, et al., page I -- 552,

paragraph labeled "CONCLUSIONS."

Claim 1's "determining one or more data points in the data set which contain

these subsets of dimensions and corresponding ranges, the one or more data points

being identified as the one or more outliers in the data set." is anticipated by Yoshioka,

et al., page I -- 549, paragraph labeled "ABSTRACT."

Claim 10

Claim 10's "identifying and mining one or more sub-patterns in the data set which have abnormally low presence not due to randomness using an algorithm capable of utilizing at least one of the processes of solution recombination, selection and mutation over a population of multiple solutions; and" is anticipated by Yoshioka, et al., page I -- 552, paragraph labeled "CONCLUSIONS."

Claim 10's "identifying one or more records which have the one or more sub-patterns present in them as the one or more outliers." is anticipated by Yoshioka, et al., page I -- 549, paragraph labeled "ABSTRACT."

Claim 11

Claim 11's "a computer having a memory and a data storage device coupled thereto, wherein the data storage device stores a data store, the data store having a high dimensional data set of personal attributes; and" is anticipated by Yoshioka, et al., page I -- 549, paragraph labeled "ABSTRACT."

Claim 11's "one or more computer programs, performed by the computer, for: " is anticipated by Yoshioka, et al., page I -- 549, paragraph labeled "ABSTRACT."

Claim 11's "(i) determining one or more subsets of dimensions and

corresponding ranges in the data set which are sparse in density using an algorithm

capable of utilizing at least one of the processes of solution recombination, selection

and mutation over a population of multiple solutions; and" is anticipated by Yoshioka, et

al., page I -- 552, paragraph labeled "CONCLUSIONS."

Claim 11's "(ii) determining one or more data points in the data set which contain

these subsets of dimensions and corresponding ranges, the one or more data points

being identified as the one or more outliers in the data set." is anticipated by Yoshioka,

et al., page I -- 549, paragraph labeled "ABSTRACT."

Claim 20

Claim 20's "a computer having a memory and a data storage device coupled

thereto, wherein the data storage device stores a data store, the data store having a

high dimensional data set of personal attributes; and" is anticipated by Yoshioka, et al.,

page I -- 549, paragraph labeled "ABSTRACT."

Claim 20's "one or more computer programs, performed by the computer for: " is

anticipated by Yoshioka, et al., page I -- 549, paragraph labeled "ABSTRACT."

Claim 20's "(i) identifying and mining one or more sub-patterns in the data set

which have abnormally low presence not due to randomness using an algorithm

capable of utilizing at least one of the processes of solution recombination, selection

and mutation over a population of multiple solutions; and" is anticipated by Yoshioka, et

al., page I -- 552, paragraph labeled "CONCLUSIONS."

    Claim 20's "(ii) identifying one or more records which have the one or more sub-

patterns present in them as the one or more outliers." is anticipated by Yoshioka, et al.,

page I -- 549, paragraph labeled "ABSTRACT."

Claim 21

    Claim 21's "determining one or more subsets of dimensions and corresponding

ranges in the data set which are sparse in density using an algorithm capable of utilizing

at least one of the processes of solution recombination, selection and mutation over a

population of multiple solutions; and" is anticipated by Yoshioka, et al., page I -- 552,

paragraph labeled "CONCLUSIONS."

    Claim 21's "determining one or more data points in the data set which contain

these subsets of dimensions and corresponding ranges, the one or more data points

being identified as the one or more outliers in the data set." is anticipated by Yoshioka,

et al., page I -- 549, paragraph labeled "ABSTRACT."

Claim 30

Claim 30's "identifying and mining one or more sub-patterns in the data set which have abnormally low presence not due to randomness using an algorithm capable of utilizing at least one of the processes of solution recombination, selection and mutation over a population of multiple solutions; and" is anticipated by Yoshioka, et al., page I -- 552, paragraph labeled "CONCLUSIONS."

Claim 30's "identifying one or more records which have the one or more sub-patterns present in them as the one or more outliers." is anticipated by Yoshioka, et al., page I -- 549, paragraph labeled "ABSTRACT."

Response to Arguments

3.   Applicant's arguments filed 10/23/2006 have been fully considered but they are not persuasive. Specifically:

Argument 1

Independent claims 1, 10, 11, 20, 21 and 30 recite patentable subject matter under § 101. An algorithm-containing invention is patentable if the invention, as a whole, produces a "useful, concrete, and tangible result," and regardless of the fact that parts of the invention fall within the judicial exceptions of patentable subject matter. AT&T Corp. v. Excel Comm. Inc., 50 U.S.P.Q.2d 1447, 1454 (1999), State Street Bank & Trust Co. v. Signature Financial Group Inc., 49 U.S.P.Q.2d 1596, 1601 (1998), In re Alappat, 31 U.S.P.Q.2d 1545, 1557 (1994). Under 35 U.S.C. §101, "[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. §101. The judicial exceptions to patentable subject matter include "laws of nature, physical phenomena, and abstract ideas." Diamond v. Chakrabarty, 206 U.S.P.Q.2d 193, 197 (1980). However, the Federal Circuit has held that an invention is not an unpatentable abstract idea, if the invention produces a "useful, concrete, and tangible result." In re Alappat, 31

> U.S.P.Q.2d at 1557; see State Street Bank, 49 U. S.P.Q.2d at 1601. <u>"The dispositive inquiry is whether the claim as a whole is directed to statutory subject matter, it is irrelevant that a claim may contain, as part of the whole, subject matter which would not be patentable by itself."</u> Alappat, 31 U.S.P.Q, at 1557.

Examiner reads the claims as a whole to carefully search for actual limitations to practical applications and finds none. It is Examiner's opinion that the claims are **<u>devoid</u>** of statutory material. Having been given ample opportunity to respond by amendment, Applicant has presented no other statutory limitations to circumscribe the metes and bounds of the claims sufficiently to change this assessment.

Accordingly, Applicant has failed to carry his burden of showing how the claims are in any way statutory. On this basis, Examiner finds Applicant's argument to be unpersuasive and the rejections STAND.

Argument 2

> Examiner contends that because the term "data set" is an abstract idea Appellants' invention is unpatentable. Appellants respectfully disagree with Examiner's application of the general rule of patentable subject matter. First, Appellants assert that the term "data set" is not an abstract idea. An "abstract idea" is an intangible concept or idea, such as, a mathematical algorithm, MPEP §2106(IV)(c); a bid, In re Schrader, 30 U.S.P.Q.2d 1455, 1458-59; or a bubble hierarchy, In re Warmerdam, 31 U.S.P.Q.2d 1754, 1759. Appellants assert that a high dimensional data set of personal attributes stored on a data storage device coupled to a computer is not an abstract idea because the high dimensional data sets are tangible. In a computing sense, the disclosed **high dimensional data set** of personal attributes can be handled, altered, or destroyed. This is unlike a mathematical formula or a basic law of nature.

Something everyone is familiar with is the concept of a "graph." A "graph" uses two variables (usually called "X" and "Y") to define a point on a plane and is, thereby a "higher dimensional data set" of dimension two.

Referred to by the "coordinate" notation (x, y) one can see that "x" and "y" are each individually abstract variables. Together, in such a "coordinate" format, (otherwise called a "vector") we also see that the "vector" is a "higher dimensional" variable of dimension two. Anyone with any training in linear algebra knows this.

Mathematically however, there is no limit to the number of dimensions such a "vector" may have...two, three, five, five hundred, five thousand, etc. In coordinate notation it would look like this: $(x_1, x_2, x_3, x_4, x_5, ...)$ One can see that there need be no end to this list...and in some branches of mathematics, one may have infinite dimensions.

In artificial intelligence, "vectors" are often used when describing something to be classified by its features. Suppose we select the features "height" for the "x" variable and "weight" for the "y" variable. Then we have a vector that looks like this: (height, weight). Using this, we may use algorithms called classifiers to classify persons according to the features "height" and "weight". In this context, the plane defined by the two variables height and weight is called a "feature space" because the plane is defined by coordinates called "features". Without these "features" attached to the "vector," the "vector" would be a pure mathematical construct: An abstract point in a mathematical space.

In the same way that the variable "x" is abstract until a real world "feature", such as "height" is attached, a " high dimensional data set" is also abstract until features such as (height, weight), (voltage, current), etc. are attached.

So. Applicant essentially asserts that the raw math concept $(x_1, x_2, x_3, x_4, x_5, \ldots)$ is concrete. It is not. It is a purely abstract point in a mathematical space.

Since an abstract point in mathematical space is neither concrete nor tangible, it cannot be sufficient by itself to establish statutory limitations to the claim.

Further, Applicant's assertion that "in a computing environment" the "high dimensional data set" can be "handled, altered, and destroyed" carries no weight...a mathematical "vector" in a computing environment is called an "array." This <u>computer programming element</u> is not a physical object any more than a <u>complete</u> "computer program per se" is a physical object...since an array may is merely a <u>component</u> of a "computer program per se."

Since an "array" is just an element of a "computer program per se," Applicant has failed to carry his burden of showing how the claims are in any way statutory. On this basis, Examiner finds Applicant's argument to be unpersuasive and the rejections STAND.

Argument 3

> Second, even if the high dimensional data sets are considered abstract
> ideas, the disclosed invention is patentable subject matter because, as in
> Alappat, the invention as a whole is directed to statutory subject matter
> and it is irrelevant that a claim may contain, as part of the whole,
> unpatentable subject matter. Therefore, optimizing data mining in a
> computer, the data mining being performed by a computer to detect one
> or more outliers in a high dimensional data set of personal attributes
> stored on a data storage device coupled to the computer, as recited in
> the independent claims, is patentable, even if it contains abstract
> concepts such as mathematical equations or other abstract ideas. <u>Since</u>

> Appellants' invention, as a whole, produces a "useful, concrete, and
> tangible result," Appellants assert that the claimed invention meets the
> basic requirements of §101 and is therefore patentable subject matter.

Examiner reads the claims as a whole to carefully search for actual limitations to practical applications and finds none. It is Examiner's opinion that the claims are **devoid** of statutory material. Having been given ample opportunity to respond by amendment, Applicant has presented no other statutory limitations to circumscribe the metes and bounds of the claims sufficiently to change this assessment.

Accordingly, Applicant has failed to carry his burden of showing how the claims are in any way statutory. On this basis, Examiner finds Applicant's argument to be unpersuasive and the rejections STAND.

Argument 4

> The subject matter of the independent claims is "useful" under 35 U.S.C.
> § 101. An invention is "useful" under § 101 if"(I) a person of ordinary skill
> in the art would immediately appreciate why the invention is useful based
> on the characteristics of the invention (e.g., properties or applications of
> a product or process), and (ii) the utility is specific, substantial, and
> credible." MPEP §2107. Appellants submit that the disclosed invention
> meets the "useful" requirement because a person of ordinary skill in the
> art of outlier detection can appreciate the disclosed methods and
> apparatus for detecting one or more outliers in a data set that is sparse
> in density. A unique data mining method is provided in the independent
> claims which applies at least one of the processes of solution
> recombination, selection and mutation over a population of multiple
> solutions. The ability to detect one or more outliers in a high dimensional
> data set of personal attributes is extremely useful and Appellants assert
> that the utility of the disclosed invention is specific, substantial, and
> credible, and therefore patentable.

Examiner reads the claims as a whole to carefully search for actual limitations to practical applications and finds none. It is Examiner's opinion that the claims are **devoid**

of statutory material. Having been given ample opportunity to respond by amendment,

Applicant has presented no other statutory limitations to circumscribe the metes and

bounds of the claims sufficiently to change this assessment.

Accordingly, Applicant has failed to carry his burden of showing how the claims

are in any way statutory. On this basis, Examiner finds Applicant's argument to be

unpersuasive and the rejections STAND.

Argument 5

> An invention has "specific utility" if it is specific to the subject matter
> claimed and can "provide a well-defined and particular benefit to the
> public." In re Fisher, 76 USPQ2d 1225, 1230 (Fed. Cir. 2005). An
> invention satisfies the "substantial utility" requirement, if the invention's
> asserted use has a significant and presently available benefit to the
> public." Fisher, 76 U.S.P.Q.2d at 1230. And "credibility" is assessed from
> "the perspective of one of ordinary skill in the art in view of the disclosure
> and any other evidence of record that is probative of the applicant's
> assertions." MPEP §2107(II). An applicant only needs to provide "one
> credible assertion of specific and substantial utility for each claimed
> invention to satisfy the utility requirement." Id.

Applicant did not claim a "specific, substantial, and credible utility." Applicant only

argues that it could have one. That utility must be in the claims.

Were Applicant to concretely specify what the " high dimensional data sets"

actually are, that might overcome the §101. Applicant has declined to make any such an

amendments to the claims.

Accordingly, Applicant has failed to carry his burden of showing how the claims

are in any way statutory. On this basis, Examiner finds Applicant's argument to be

unpersuasive and the rejections STAND.

Argument 6

The subject matter of the independent claims is specific because it relates to optimizing data mining in a computer. Appellants' disclosure has a well-defined and particular benefit to the public because it involves detecting one or more outliers in a high dimensional data set of personal attributes where one or more subsets of dimensions and corresponding ranges in the data set are sparse in density. Appellants assert that the disclosed invention can detect outliers in data sets where current outlier detection methods may not be able to. For this reason, the subject matter of the independent claims has substantial utility because of its significance to data mining and outlier detection. Furthermore, the subject matter of the independent claims is substantial because the significant benefits of the disclosure are presently available to benefit the public. Finally, the subject matter of the independent claims is credible because a person having ordinary skill in the art of data mining and outlier detection would recognize the specific and substantial utility of Appellants' invention.

Practice on a regular general purpose computer is not sufficient to make an abstract algorithm statutory. Therefore, it is insufficient to make the claims statutory. As the Supreme Court has held:

"Our recent holdings in Gottschalk v. Benson, supra, and Parker v. Flook, supra, both of which are computer-related, stand for no more than these long established principles. In Benson, we held unpatentable claims for an algorithm used to convert binary code decimal numbers to equivalent pure binary numbers.

The sole practical application of the algorithm was in connection with the programming of a **general purpose digital computer.** We defined "algorithm" as a "procedure for solving a given type of mathematical problem," and we concluded that such an algorithm, or mathematical formula, is like a law of nature, which **cannot be the subject of a patent.**" See, Diamond v. Diehr 450 US 175, 185 (1981).

No matter how Applicant seeks to interpret Federal Circuit case law, it cannot be interpreted as an attempt to overrule the Supreme Court.

Accordingly, Applicant has failed to carry his burden of showing how the claims

are in any way statutory. On this basis, Examiner finds Applicant's argument to be

unpersuasive and the rejections STAND.

Argument 7

The subject matter of the independent claims is "tangible" under 35
U.S.C. §101. An invention is "tangible" under § 101 if the "process claim
sets forth a practical application of a § 101 judicial exception to produce
a real-world result." MPEP §2106(IV)(c). "A[n] application of a law of
nature or mathematical formula to a... process may well be deserving of
patent protection." Diamond v. Diehr, 209 U.S.P.Q. 1, 8. Appellants
assert that detecting outliers in a data set which is sparse in density is a
tangible result. Although Appellants' utilize mathematical formulas in
detecting one or more outliers in a high dimensional data set of personal
attributes, the application of the mathematical formulas produce a real-
world result. Examiner contends that Appellants are simply manipulating
abstract ideas and that there is no "transformation of real-world data
(such as monetary data or heart rhythm data) by some disclosed
process." (Office Action pg. 6-7). Appellants respectfully disagree.
Detecting one or more outliers in a high dimensional data set, where the
one or more subsets of dimensions and corresponding ranges in the
data set are sparse in density, is a transformation of real-world data. The
transformation is taking an unorganized sparse data set and detecting
one or more outliers within the data set. Even if the data set is not
specified, there is a tangible result because the outliers in the data set
are singled out.

"High dimensional data sets" are not real world things. One cannot take a photo

of one of these or thunk it on a table and say "Look! A multidimensional data object!"

They are <u>pure data</u>, they are <u>pure algorithmic/mathematical constructs</u>. Therefore, they

cannot be the basis of calling a claim "statutory."

Accordingly, Applicant has failed to carry his burden of showing how the claims

are in any way statutory. On this basis, Examiner finds Applicant's argument to be

unpersuasive and the rejections STAND.

Argument 8

> The subject matter of the independent claims is "concrete" under 35
> U.S.C. §101. An invention is "concrete" under § 101 if the process has "a
> result that can be substantially repeatable or the process must
> substantially produce the same result again." MPEP § 2106(IV)(C)(2)(c).
> The subject matter of the independent claims is substantially repeatable
> because the disclosed invention will detect the same outliers for a
> specific high dimensional data set of personal attributes.

How can one say that it is repeatable when the variables are undefined? There

are no limitations that say that the "data sets" cannot be "random variables" (i.e., a

probabilistic variable describing the behavior of a randomly operating system such as a

roulette wheel, or die, etc.) It could be a theoretical "die" with an infinite number of

faces...there are no limitations to limit the number of values the random variable may

take...so it may be infinite...it may be a theoretical "die" with an _infinite_ number of faces.

Therefore, one cannot say that it is at all repeatable.

Accordingly, Applicant has failed to carry his burden of showing how the claims

are in any way statutory. On this basis, Examiner finds Applicant's argument to be

unpersuasive and the rejections STAND.

Argument 9

> Examiner contends that the subject matter of the independent claims is
> not concrete and tangible because "there are a myriad of possible
> practical applications." (Office Action pg. 8). Appellants submit that
> because an invention has a number of possible practical applications
> does not make it unpatentable. Appellants' invention is specific because
> it involves optimizing data mining in a computer by detecting one or more
> outliers in a high dimensional data set of personal attributes stored on a
> data storage device coupled to the computer. For this reason, Appellants
> assert that they do not need to specify with over-limiting precision what
> type of data the disclosed invention is processing.

Applicant's argument that his claims can be applied to "personal attributes" is

insufficient to actually limit his claims to such applications.

Firstly that element is in the preamble and not the body of the claim, so it is not

limiting.

Secondly, even if it were in the body, it is insufficient because it only defines the

"technological environment" of the claimed invention...not specifically whether the

practical use is a medical diagnostic system, a credit risk calculator, or whatever. As the

Supreme Court has held:

> "We have before us today only the question of whether respondents'
> claims fall within the §101 categories of possibly patentable subject
> matter. We view respondents' claims as nothing more than a process for
> molding rubber products and not as an attempt to patent a mathematical
> formula. We recognize, of course, that when a claim recites a
> mathematical formula (or scientific principle or phenomenon of nature),
> an inquiry must be made into whether the claim is seeking patent
> protection for that formula in the abstract. A mathematical formula as
> such is not accorded the protection of our patent laws, Gottschalk v.
> Benson, supra, and this principle cannot be circumvented by attempting
> to limit the use of the formula to a particular **technological**
> **environment**. Parker v. Flook, supra. <u>Similarly, insignificant post-solution</u>
> <u>activity will not transform an unpatentable principle into a patentable</u>
> <u>process. Ibid.14 To hold otherwise would allow a competent draftsman to</u>
> <u>evade the recognized limitations on the type of subject matter eligible for</u>
> <u>patent protection</u>. Diamond, Commissioner of Patents and Trademarks v.
> Diehr and Lutton, 450 U.S. 175, 192 (1981).

Since the term is only in the preamble and not limiting, Applicant's supposed

"limitations" are only subsets of the actual matter limited by the claims. An argument

using erroneously limiting subsets of the actual metes and bounds of the claims is not

sufficient to limit the claims to statutory matter because the "claims must be given their

<u>broadest reasonable interpretation</u>." See, MPEP 2111 (emphasis added.)

Applicant based his argument on the narrower subsets of the actually claimed matter, thereby presenting erroneously narrow claim interpretations that appear more acceptable than the ones actually drafted into the claims.

Applicant must expressly present limitations that, in their broadest reasonable interpretation, denote statutory limitations to a practical application.

Examiner cannot even rely on Festo's "prosecution history estoppel" to limit the claims to the matter in Applicant's argument, since such doctrine of equivalents issues are actually decided later in Court after an application has been allowed and later contested. Accordingly, Applicant's arguments cannot, at this early stage, be presumed by Examiner to be so limiting.

Examiner reads the claims as a whole to carefully search for actual limitations to practical applications and finds none. It is Examiner's opinion that the claims are devoid of statutory material. Having been given ample opportunity to respond by amendment, Applicant has presented no other statutory limitations to circumscribe the metes and bounds of the claims sufficiently to change this assessment.

Accordingly, Applicant has failed to carry his burden of showing how the claims

are in any way statutory. On this basis, Examiner finds Applicant's argument to be

unpersuasive and the rejections STAND.

Conclusion

4.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

A.   Marko et al. (U.S. Patent Number 5,361,628 A; dated 08 NOV 1994; class 73;

      subclass 116) discloses a system and method for processing test measurements

      collected from an internal combustion engine for diagnostic purposes.

B.   Schroeder et al. (U.S. Patent Number 5,166,747 A; dated 24 NOV 1992; class

      356; subclass 326) discloses an apparatus and method for analyzing the
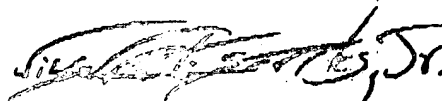
      composition of formation fluids.

C.   Safinya et al. (U.S. Patent Number 4,994,671 A; dated 19 FEB 1991; class 250;

      subclass 255) discloses an apparatus and method for analyzing the composition

      of formation fluids.

Any inquiry concerning this communication or earlier communications from the

Examiner should be directed to Wilbert L. Starks, Jr. whose telephone number is (571)

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20 FEB 2007